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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,707	04/18/2001	Bo Pi	07402-026001	8800

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FISH & RICHARDSON, PC
12390 EL CAMINO REAL
SAN DIEGO, CA 92130-2081

EXAMINER	
ROSE, KIESHA L	
ART UNIT	**PAPER NUMBER**
2822	

DATE MAILED: 07/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/838,707	PI ET AL.	
	Examiner	Art Unit	
	Kiesha L. Rose	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-45 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the request for reconsideration filed 18 May 2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-13,16-18, 29-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland (U.S. Patent 6,259,085) in view of Akai (U.S. Patent 4,914,301).

Holland discloses a back illuminated charge coupled device (Fig. 2a) that contains a n-type silicon substrate (18) with a first and second surface opposing each other, a polycrystalline transparent conductive bias layer (12) formed over the back surface and in electrical contact and formed internal to the substrate (18) by doping the substrate (18), an antireflection layer (20) formed on the electrode layer (12) an array of doped p-type gate regions (27) formed on the second surface and a circuit layer (11) formed over the second surface to provide a gate contact to and a readout circuit for each doped region. Holland discloses all of the limitations except for a grid of conducting wires and a scintillation. Whereas Akai discloses a photodetector (Figs. 1-4) that contains an array of photodiodes (12-1-12-n) with an array of gates (12), a grid of

aluminum conducting wires (5/6) formed of a first set of wires (5) extending in a first direction and a second set of wires (6) extending orthogonal to the first set and the array of wires surround the array of photodiodes that form pixels, an antireflection layer (4) that is coplanar to the conducting wires, a bias layer (7) as a back contact layer, an array of plural scintillation elements (1-1- 1-n) at plural locations and each of the elements corresponding to one of the plurality of photodiode areas with optically reflective surfaces (2b) disposed between the other scintillation elements and the scintillation comprising trenches (2) with reflective material (2a) formed in trenches. The grid of conducting wires is formed to for outputting the electrical signal of the detection region and trapped region. (Column 2, lines 33-37) The array of scintillation are formed to covert incident x-rays into light rays. (Column 2, lines 12-15) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Holland by incorporating grid of conducting wires and an array of scintillators for outputting the electrical signal of the detection region and trapped region and converting incident x-rays into light rays as taught by Akai. In regards to a bias voltage applied to the substrate, it would have been obvious to one having ordinary skill in the art at the time the invention was made to bias a bias layer to provide an current to the substrate to the doped gate regions.

Claims 19-21, 24-28, 39-43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland (U.S. Patent 6,259,085) in view of Akai.

Holland discloses a back illuminated charge coupled device (Fig. 2a) that contains a n-type silicon substrate (18) with a first and second surface opposing each

other, a polycrystalline transparent conductive bias electrode layer (12) formed over the back surface and in electrical contact and formed internal to the substrate (18) by doping the substrate (18), an antireflection layer (20) formed on electrode layer (12) an array of doped p-type gate regions (27) formed on the second surface and a circuit layer (11) formed over the second surface to provide a gate contact to and a readout circuit for each doped region. Holland discloses all of the limitations except for a grid of conducting wires and a scintillation. Whereas Akai discloses a photodetector (Figs. 1-4) that contains an array of photodiodes (12-1-12-n) with an array of gates (12), a grid of aluminum conducting wires (5/6) formed of a first set of wires (5) extending in a first direction and a second set of wires (6) extending orthogonal to the first set and the array of wires surround the array of photodiodes that form pixels, an antireflection layer (4) that is coplanar to the conducting wires, a bias layer (7) as a back contact layer, an array of plural scintillation elements (1-1- 1-n) at plural locations and each of the elements corresponding to one of the plurality of photodiode areas with optically reflective surfaces (2b) disposed between the other scintillation elements and the scintillation comprising trenches (2) with reflective material (2a) formed in trenches. The grid of conducting wires is formed to for outputting the electrical signal of the detection region and trapped region. (Column 2, lines 33-37) The array of scintillation are formed to covert incident x-rays into light rays. (Column 2, lines 12-15) Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Holland by incorporating grid of conducting wires and

an array of scintillators for outputting the electrical signal of the detection region and trapped region and converting incident x-rays into light rays as taught by Akai.

Claims 14-15 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland, and Akai as applied to claim 1 above, and further in view of Kasai et al. (U.S. Patent 5,262,633).

Holland and Akai disclose all of the limitations except for the antireflection layer to include a dielectric layer. Whereas Kasai discloses a wideband antireflection coating (Fig. 1) that contains a multilayer antireflection layer (30) comprised of dielectric layers (30a) having a specific refractive index. The antireflection layer comprises dielectric layers to enable detection of light at visible as well as infrared wavelengths. (Column 1, lines 11-13) Since Holland, Akai and Kasai are both from the same field of endeavor, semiconductor device, the purpose disclosed by Kasai would have been recognized in the pertinent art of Holland and Akai. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the devices of Holland and Akai by incorporating an antireflection layer comprising a dielectric layer to enable detection of light at visible and infrared wavelengths as taught by Kasai.

Claims 22-23 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland and Akai as applied to claims 19 and 41 above, and further in view of Kasai et al. (U.S. Patent 5,262,633).

Holland and Akai disclose all of the limitations except for the antireflection layer to include a dielectric layer. Whereas Kasai discloses a wideband antireflection coating (Fig. 1) that contains a multilayer antireflection layer (30) comprised of dielectric layers

(30a) having a specific refractive index. The antireflection layer comprises dielectric layers to enable detection of light at visible as well as infrared wavelengths. (Column 1, lines 11-13) Since Holland, Akai and Kasai are both from the same field of endeavor, semiconductor device, the purpose disclosed by Kasai would have been recognized in the pertinent art of Holland and Akai. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the devices of Holland and Akai by incorporating an antireflection layer comprising a dielectric layer to enable detection of light at visible and infrared wavelengths as taught by Kasai.

Response to Arguments

Applicant's arguments filed 18 May 2004 have been fully considered but they are not persuasive. Applicant's argue that the Akai reference does not disclose the grid of conducting wires substantially orthogonal to one another, this is erroneous the Akai reference disclose a grid of conducting wires 5 and 6. The applicant states that the Akai reference discloses figures 3 and 4 are cross sections and show that they are not orthogonal to each other but as seen in applicant's figure 1 it is also a cross section of the grid of conducting wires and the figures are shown as the same and the grid of conducting wires of Akai are substantially orthogonal to each other and therefore the rejection stands.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 571-272-1844. The examiner can normally be reached on M-F 8:30-6:00 off 2nd Mondays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KLR

Michael Trinh
Primary Examiner
Act SPE